

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/GB2005/000132

International filing date (day/month/year)
17.01.2005

Priority date (day/month/year)
16.01.2004

International Patent Classification (IPC) or both national classification and IPC
H01L51/20

Applicant
CAMBRIDGE UNIVERSITY TECHNICAL SERVICES LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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10/586149

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/GB2005/000132

AP20Rec'd PCT/PTO 14 JUL 2006

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. II Priority

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE
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Box No. V Reasoned statement under Rule 43*b*/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-10,12-21
Inventive step (IS)	Yes: Claims	
	No: Claims	1-10,12-21
Industrial applicability (IA)	Yes: Claims	1-21
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**WRITTEN OPINION OF THE
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International application No.

PCT/GB2005/000132

Re Item V.

1 Reference is made to the following documents:

- D1: E.J. MEIJER ET AL.: "SOLUTION-PROCESSED AMBIPOLAR ORGANIC FIELD-EFFECT TRANSISTORS AND INVERTERS" NATURE MATERIALS, vol. 2, 21 September 2003 (2003-09-21), pages 678-682, XP002327478 LONDON
- D2: EP-A-1 306 909 (INTERUNIVERSITAIR MICRO-ELEKTRONICA CENTRUM; LIMBURG UNIVERSITEIT CENT) 2 May 2003 (2003-05-02)
- D3: EP-A-1 306 910 (INTERUNIVERSITAIR MICRO-ELEKTRONICA CENTRUM ; AGFA-GEVAERT N.V; LIMBUR) 2 May 2003 (2003-05-02)
- D4: EP-A-1 102 335 (LUCENT TECHNOLOGIES INC) 23 May 2001 (2001-05-23)
- D5: CHUA, LAY-LAY ET AL: "General observation of n-type field-effect behavior in organic semiconductors" NATURE, ISSN: 0028-0836, vol. 434, no. 7030, 10 March 2005 (2005-03-10), pages 194-199, XP002327479 LONDON, UNITED KINGDOM

2 INDEPENDENT CLAIM 1

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.
Document D1 discloses (the references in parentheses applying to this document):
An n-channel/ambipolar FET (Fig. 5) with at least an electron affinity of the gate dielectric layer being greater than or equal to the electron affinity of the semiconducting material (which is preferably between 2 and 4 eV, see claim 4 of the present application). For the values of the electron affinity see the LIMO energies as depicted in Figure 2.

3 INDEPENDENT CLAIMS 16, 17, 18, 20, 21

- 3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 16, 17, 18, 20, 21 is not new in the sense of Article 33(2) PCT.

These claims are related to claim 1 in so far as they contain either explicit or implicit back reference to it. Hence the same argumentation applies *mutatis mutandis* as provided in 2.1.

4 DEPENDENT CLAIMS 2-10, 12-15, 19

Dependent claims 2-10, 12-15, 19 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

5 DEPENDENT CLAIM 11

The combination of the features of dependent claim 11 is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:
The particular chemical entity Si-O-Si, which is also mentioned as the preferred embodiment in the description page 27 ff., has a special technical effect associated with it, both is neither suggested nor disclosed in the prior art at hand (see also D5)

Re Item VIII

Certain observations on the international application

1. The definition of the invention by the parameters according to claim 1 is considered obscure. The prior art refers to energy levels more in relative terms rather than absolute values. As D1-D4 do disclose such relation in its entirety, it has been refrained from objecting to such wording on the search stage by issuance of an incomplete search, however it has to be pointed out, that such vague definition has more the character of a general scientific thesis or a discovery. Especially with prior art falling within the claimed range there appears no remedy to reestablish novelty maintaining the current wording.

Thus another way of defining the invention is considered appropriate here in order to comply not only with the requirements of Art. 6 PCT.

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It has to be pointed out, that given the general teaching of claim 1 is applicable in its broad manner over the entire range claimed (as demanded by Art. 5 PCT) and as such represents a general concept in the art, and given the fact that there have been devices prepublished showing the same effect their existence necessarily and logically anticipates novelty of such a claim, regardless which complicated wording might be chosen to hide novelty problems.